

Date: Thu, 2 Jun 94 04:30:28 PDT  
From: Ham-Homebrew Mailing List and Newsgroup <ham-homebrew@ucsd.edu>  
Errors-To: Ham-Homebrew-Errors@UCSD.Edu  
Reply-To: Ham-Homebrew@UCSD.Edu  
Precedence: Bulk  
Subject: Ham-Homebrew Digest V94 #148  
To: Ham-Homebrew

Ham-Homebrew Digest                      Thu, 2 Jun 94                      Volume 94 : Issue 148

Today's Topics:

    Getting a VFO on-frequency (W1FB Design NB p. 111) (3 msgs)  
        Phase noise floor of Motorola CMOS PLL dividers  
            QRP mailing list? (3 msgs)  
    Schematics for Luxor 1909530, Magnum Microwave c24-3  
        simple SSB receiving methods (2 msgs)  
            Techno Whizzy DDS

Send Replies or notes for publication to: <Ham-Homebrew@UCSD.Edu>  
Send subscription requests to: <Ham-Homebrew-REQUEST@UCSD.Edu>  
Problems you can't solve otherwise to brian@ucsd.edu.

Archives of past issues of the Ham-Homebrew Digest are available  
(by FTP only) from UCSD.Edu in directory "mailarchives/ham-homebrew".

We trust that readers are intelligent enough to realize that all text  
herein consists of personal comments and does not represent the official  
policies or positions of any party. Your mileage may vary. So there.

-----  
Date: 1 Jun 1994 12:09:34 GMT  
From: ihnp4.ucsd.edu!usc!howland.reston.ans.net!usenet.ins.cwru.edu!po.cwru.edu!  
sct@network.ucsd.edu  
Subject: Getting a VFO on-frequency (W1FB Design NB p. 111)  
To: ham-homebrew@ucsd.edu

I'm working on the DC receiver on page 111 of \_W1FB's Design Notebook\_  
as a first homebrew project. It sure has been educational... :-)  
The current problem is that the VFO insists on operating around 5.5 MHz.  
I need it up around 7 MHz if this is going to be a 40m receiver. It's  
a JFET Hartley VFO with a 4.8 uH inductor tapped 1/4 of the way up for  
feedback, 100-125 pF of tank capacitance, and a 100 pF capacitor coupling  
the top of the tank circuit to the JFET gate. I'm using an MPF102 for  
the JFET. The circuit is built dead bug style.

The values shown for the oscillator work out to 6.5 MHz to 7.25 MHz if I  
ignore the 100 pF gate capacitor. How much is that capacitor going to

pull the frequency?

Does the design look sound, in general? I double-checked my wiring and component values several times. Any other suggestions for things I should check?

Stephen

--

Stephen Trier  
sct@po.cwru.edu  
KG8IF

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Date: 1 Jun 1994 17:00:39 -0700  
From: nntp.crl.com!crl.crl.com!not-for-mail@decwrl.dec.com  
Subject: Getting a VFO on-frequency (W1FB Design NB p. 111)  
To: ham-homebrew@ucsd.edu

In article <2shtpu\$h0m@usenet.INS.CWRU.Edu> sct@po.cwru.edu (Stephen C. Trier) writes:

>The current problem is that the VFO insists on operating around 5.5 MHz.  
>I need it up around 7 MHz if this is going to be a 40m receiver. It's  
>a JFET Hartley VFO with a 4.8 uH inductor tapped 1/4 of the way up for  
>feedback, 100-125 pF of tank capacitance, and a 100 pF capacitor coupling  
>the top of the tank circuit to the JFET gate. I'm using an MPF102 for  
>the JFET. The circuit is built dead bug style.  
>The values shown for the oscillator work out to 6.5 MHz to 7.25 MHz if I  
>ignore the 100 pF gate capacitor. How much is that capacitor going to  
>pull the frequency?

Have you tried spreading or squeezing the wires together on the inductor?  
I think he mentions somewhere in his book that you might have to do that.  
Hope this helps!

Jeff

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Jeff Jones AB6MB  
jeffj@crl.com

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Date: 2 Jun 1994 07:13:07 -0400  
From: newstf01.crl.aol.com!search01.news.aol.com!not-for-mail@uunet.uu.net  
Subject: Getting a VFO on-frequency (W1FB Design NB p. 111)  
To: ham-homebrew@ucsd.edu

In article <2sj7f7\$0as@crl.crl.com>, jeffj@crl.com (Jeff Jones) writes:

>The current problem is that the VFO insists on operating around 5.5 MHz.  
>I need it up around 7 MHz if this is going to be a 40m receiver. It's  
>a JFET Hartley VFO with a 4.8 uH inductor tapped 1/4 of the way up for  
>feedback, 100-125 pF of tank capacitance, and a 100 pF capacitor coupling  
>the top of the tank circuit to the JFET gate. I'm using an MPF102 for  
>the JFET. The circuit is built dead bug style.  
>The values shown for the oscillator work out to 6.5 MHz to 7.25 MHz if I  
>ignore the 100 pF gate capacitor. How much is that capacitor going to  
>pull the frequency?

It has been my experience that you'll need to play with either squeezing the inductor windings closer together (or moving them farther apart), or try some different caps to get resonance at the correct freq. You also might try a small trimmer at the gate (rather than the 100 pF) to find a value that doesn't pull the freq, but allows reliable start up. Stray capacitance and inductance is probably the culprit here. This is what experimenting is all about. Don't get frustrated (I did, it doesn't help)--just play with it until it works!

Good Luck

72 (+/- 1) Jim N00CT

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Date: 1 Jun 1994 21:43:40 GMT  
From: ihnp4.ucsd.edu!usc!elroy.jpl.nasa.gov!lll-winken.llnl.gov!korie!  
newsworthy.West.Sun.COM!abyss.West.Sun.COM!sunspot!myers@network.ucsd.edu  
Subject: Phase noise floor of Motorola CMOS PLL dividers  
To: ham-homebrew@ucsd.edu

Does anyone have empirical information on the phase noise floor of the dividers in the Motorola CMOS PLL chips, such as the MC145157 and MC145170? I'm tending to guess towards -150dBc, a number I've seen published for

CMOS dividers, but is this accurate?

This is of particular interest with respect to the on-chip reference divider in the Motorola CMOS PLLs. I would guess the phase noise level of the reference frequency, when driven with the on-chip oscillator using a crystal, is going to be primarily determined by the divider.

Any comments?

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\* Dana H. Myers KK6JQ, DoD#: j | Views expressed here are  
\*  
\* (310) 348-6043 | mine and do not necessarily \*  
\* Dana.Myers@West.Sun.Com | reflect those of my employer  
\*  
\* This Extra supports the abolition of the 13 and 20 WPM tests \*

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Date: Wed, 1 Jun 1994 19:28:20 GMT  
From: ihnp4.ucsd.edu!swrinde!cs.utexas.edu!wotan.compaq.com!  
twisto.eng.hou.compaq.com!news@network.ucsd.edu  
Subject: QRP mailing list?  
To: ham-homebrew@ucsd.edu

Is the QRP mailing list still around?

73,

Brad  
aa8if@bangate.compaq.com

-----  
Date: Wed, 1 Jun 1994 22:19:47 GMT  
From: ihnp4.ucsd.edu!usc!nic-nac.CSU.net!charnel.ecst.csuchico.edu!  
yeshua.marcam.com!news.kei.com!uhog.mit.edu!news.mtholyoke.edu!news.unomaha.edu!  
cwis!pschleck@network.ucsd.edu  
Subject: QRP mailing list?  
To: ham-homebrew@ucsd.edu

In <77049530034n12@131.168.114.12> Brad=Staff%PC=SW%PCPD=Hou@bangate.compaq.com  
writes:

>Is the QRP mailing list still around?

>73,

>Brad  
>aa8if@bangate.compaq.com

As far as I know it is. Check my Elmers Directory (just posted to  
rec.radio.info) for more info.

73, Paul W. Schleck, KD3FU

pschleck@unomaha.edu

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Date: 1 Jun 1994 16:55:37 -0700  
From: nntp.crl.com!crl.crl.com!not-for-mail@decwrl.dec.com  
Subject: QRP mailing list?  
To: ham-homebrew@ucsd.edu

>In <77049530034n12@131.168.114.12> Brad=Staff%PC=SW%PCPD=Hou@bangate.compaq.com  
writes:

>  
>>Is the QRP mailing list still around?  
>  
>>73,  
>  
>>Brad  
>>aa8if@bangate.compaq.com

To subscribe to the QRP mailing list do the following;

email to majordomo@think.com

Subject: You can leave it blank

subscribe qrp or unsubscribe qrp to quit receiving it.

It is automated so you will receive an reply telling you that they got it.  
Then shortly there after and sometimes along with it you will receive  
the QRP mailing list. There are new messages constantly being sent as it  
is very active.

Jeff  
--  
Jeff Jones AB6MB  
jeffj@crl.com

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Date: 1 Jun 1994 21:35:08 GMT

From: ihnp4.ucsd.edu!dog.ee.lbl.gov!overload.lbl.gov!agate!uclink2.berkeley.edu!  
jdchess@network.ucsd.edu  
Subject: Schematics for Luxor 1909530, Magnum Microwave c24-3  
To: ham-homebrew@ucsd.edu

I'm looking for some documentation on a Luxor receiver (1909350) and  
Magnum Microwave downconverter (c24-3) to assist with repair. I've  
already contacted Magnum and found out they've shredded all their  
schematics, but if anyone has experience of useful information on  
these historical pieces I'd appreciate it.

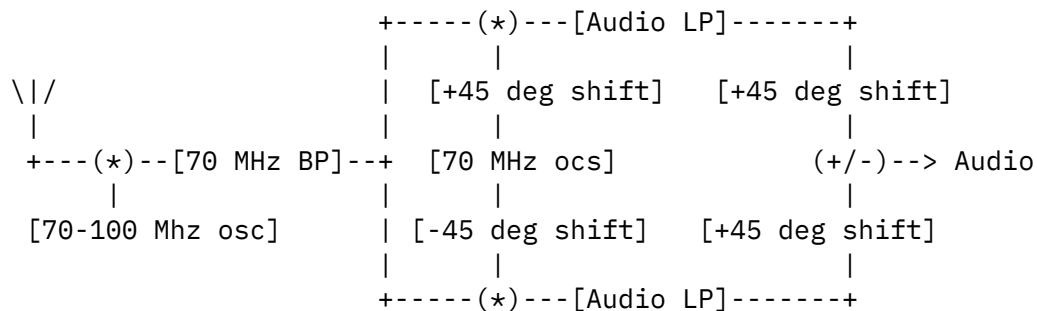
Thanks in advance,

james ab6yh

/ jdchess@uclink2.berkeley.edu

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Date: 1 Jun 1994 11:25:53 GMT  
From: ihnp4.ucsd.edu!agate!howland.reston.ans.net!pipex!sunic!EU.net!sun4n1!  
fwi.uva.nl!agterkam@network.ucsd.edu  
Subject: simple SSB receiving methods  
To: ham-homebrew@ucsd.edu

Currently I'm planning to build a receiver, who doesn't.  
However, my intension is NOT to use Xtal filters and NOT  
to use a large number of OPAMPS to create sharp lowpass  
filters. My plan is to use a phasing method instead.  
The basic setup is as follows:



The 70 MHz BandPass and Audio Lowpass filters will be of a  
(passive) LC type (width bandwidth). My problem then is:

The audio phase shifters of +- 45 degree do have to be precise  
and do have to have a bandwidth of 20 kHz or more.  
At the moment this seems to be difficult without OPAMPS or a large  
number of resistors and capacitors.

Can anyone give me some advice on how to solve the phase shift  
problem. Does a simple and inexpensive method exist to phase

shift a wide spectrum of, lets say, 100 kHz by 45 degrees ?

Thanks in advance, Dirk. e-mail: agterkam@fwi.uva.nl

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Date: Wed, 1 Jun 1994 19:23:11 GMT  
From: ihnp4.ucsd.edu!agate!howland.reston.ans.net!math.ohio-state.edu!  
magnus.acs.ohio-state.edu!csn!col.hp.com!srigenprp!alanb@network.ucsd.edu  
Subject: simple SSB receiving methods  
To: ham-homebrew@ucsd.edu

Dirk-Jan Agterkamp (I89) (agterkam@fwi.uva.nl) wrote:

: Currently I'm planning to build a receiver, ...

: My plan is to use a phasing method instead. ...

: The audio phase shifters of +- 45 degree do have to be precise

: and do have to have a bandwidth of 20 kHz or more.

: At the moment this seems to be difficult without OPAMPS or a large

: number of resistors and capacitors.

: Can anyone give me some advice on how to solve the phase shift

: problem. Does a simple and inexpensive method exist to phase

: shift a wide spectrum of, lets say, 100 kHz by 45 degrees ?

You could use the Weaver ("Third method" of SSB generation).  
I believe it is covered in the ARRL Handbook. Briefly, you  
replace the audio phase shift networks with a pair of mixers,  
fed with 90-degree-out-of-phase oscillators with a frequency  
in the middle of the audio passband. When you sum the mixer  
outputs, you get USB or LSB, depending on whether it's a  
+ or - 90 degree phase relationship. Oh, by the way, the  
low-pass audio filters at the mixer inputs have a cut-off  
frequency of 1/2 the audio bandwidth (just below the  
oscillator freq).

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Date: Wed, 1 Jun 1994 18:43:53 GMT  
From: ihnp4.ucsd.edu!library.ucla.edu!europa.eng.gtefsd.com!  
howland.reston.ans.net!newsserver.jvnc.net!panasonic.com!atv16!  
wiseman@network.ucsd.edu  
Subject: Techno Whizzy DDS  
To: ham-homebrew@ucsd.edu

I purchased a Novatech DD3 kit for about \$100. This kit is based around a

32 MHz. Qualcomm chip, and is meant as a sort of demo board. I modified the input by placing latches there to create a PC parallel port interface. I use this board in my homebrew 80m transceiver with an IF of 4.9152 MHz. In this application, several spurs are noticable, for the reasons given by one of the previous posters. They are not really objectionable, as they are at the LSB resolution (2 Hz) and can be easily tuned around. My present software is keyboard controlled - I use the up/down keys to give me a large frequency change, and the left/right keys to give me a small change. My preference is 1000 and 100 Hz, respectively, but this is also programmable.

A second set of latches contains the transmit frequency, which is switched on when I depress my key. The software automatically updates this transmit register whenever I change frequency in the receiver so that the correct offset is maintained. As was correctly stated previously, the deficiencies of the DDS as a receiver LO are not noted in my transmitter, due to filtering and the fact that I am using a class C amplifier on the output. My lab's spectrum analyzer shows that all harmonics are at least 45 dB down from the carrier, even with the DDS being used as a "direct drive".

Some noise reduction on the Novatech board will allow better performance. For example, the clock driver design allows a fair amount of 32 MHz to come out the back door (verified with a spectrum analyzer). I modified this circuit and replaced the rather cheap PCB trace with coax to help reduce this. Also, to save money they use an 8-bit DAC, even though the Qualcomm output is 10-bits. I'm in the process of replacing this one as the quantization noise is very high with only 8 bits.

Overall, quite interesting to play with, and certainly more stable than any analog LO that I have built. It also makes a good direct drive CW transmitter source. Future work here will involve a nice, user friendly GUI for the PC...

John  
KA5WTO

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Date: 1 Jun 1994 05:53:09 GMT  
From: ihnp4.ucsd.edu!agate!usenet.ins.cwru.edu!eff!news.kei.com!hookup!  
news2.sprintlink.net!news.sprintlink.net!indirect.com!patrick@network.ucsd.edu  
To: ham-homebrew@ucsd.edu

References <2sd787\$mgn@search01.news.aol.com>, <2se6pi\$kfg@herald.indirect.com>,  
<2sfmnc\$1pd@crl2.crl.com>t  
Subject : Re: Techno Whizzy DDS

Jeff Jones (jeffj@crl.com) wrote:  
: I really hope that you don't keep this all to yourself! 8-) I have wanted to  
: do one of those for quite a while. What has your costs been so far? How much



: is the Qualcomm DDS and where did you get it? Thanks for any info you can  
: give me!

I got the Qualcomm Q2334 dual dds from Cain Technology, (602) 966-4322  
FAX (602) 968-5132. It comes in 3 speeds - 20 ksps \$69 in onesies -  
30 ksps for \$79 and 50 ksps for \$209.

I am using two TRW TDC1012 12 bit 20 msp/s DACs for the two outputs.  
(Can we spell quadrature spread spectrum? :>) I can not remember what I  
paid for them but they were not real cheap. Invest in a PC proto board, if  
that is the route you want to build around, that has the interface  
electronics built into the board. It sure simplifies life. They run about  
\$70 for a 16 bit board.

My crystal is an Anderson Electronics model 601 20 MHz. Their number is  
(814) 695-4428.

Hope you find the parts you need! The Qualcomm literature has most of the  
info you need for building a spread spectrum setup.

Pat

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End of Ham-Homebrew Digest V94 #148

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